



TWIG LOCATOR User's Manual

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- This tracking device is designed for use on the E-GSM900/ DCS 1800/ PCS 1900 MHZ Tri Band networks. You can use the device in all countries where the GSM network operators have a roaming contract with your network operator.
- The device also includes integrated high-performance 12-channel GPS receiver. The unique combination of GPS and GSM equipment in this device enables features like tracking and location requests as well as emergency calls and messages. In order to function properly, some of these features may require third-party services. BENEFON is not responsible for such services, their existence, functionality or compatibility with BENEFON products.
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- Some of the features described in this guide may be optional and intended to be purchased separately. For details, please contact your dealer. For more information, details and descriptions, including assortment of chargers and accessories, please visit the web site: www.benefon.com.
- BENEFON warrants its products to be free of defects in material or workmanship when leaving the factory. A warranty certificate with the date of purchase is enclosed in the delivery. For details, see the warranty certificate. Hereby, Benefon Oyj declares that this tracking device, type TGP85EG, is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
- FCC warning statements: This device complies with part 15 of the FCC Rules. Operation is subject to following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Changes or modifications not expressly approved by the party responsible for compliance would void the user's authority to operate the equipment.
- ACCESSORIES AND BATTERIES: use only accessories and batteries accepted by the product manufacturer. Do not use incompatible accessories and batteries.
- Benefon and Twig are registered trademarks of Benefon Oyj.

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Made in Finland.

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CE 0413



Correct disposal of this product:
The tracking device should not be disposed with household or other commercial wastes. Remove the battery from the phone and dispose it according to local battery recycling laws.

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TWIG LOCATOR

Twig Locator is an auxiliary device for locating and tracking different targets. Place Locator on your desired target, e.g car, and you can easily monitor its location.

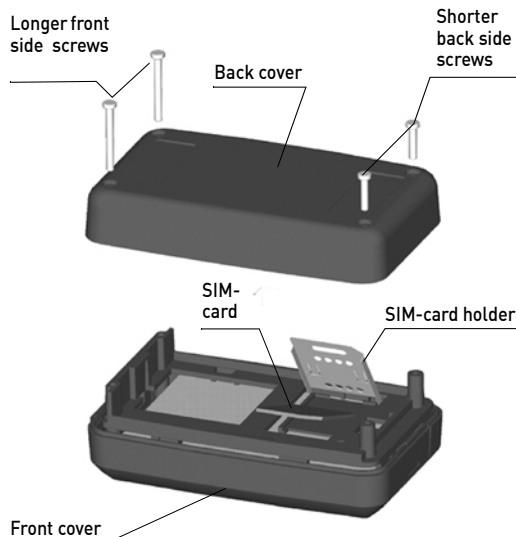
Twig Locator can send you continuously updated position messages. With these messages, you can easily track your Locator's movements. You can also create an anchor that alarms you if your Locator is moved outside of your defined area.

You can call and send messages to Locator for its updated position at any time. Additionally, by making a voice call, you can also listen to what happens nearby the device.

Twig Locator is a GSM-device with in-built GPS-positioning and support for MPTP commands. It can be used with any corresponding Benefon GPS-GSM phones and back-end devices with support for MPTP commands.

GETTING STARTED

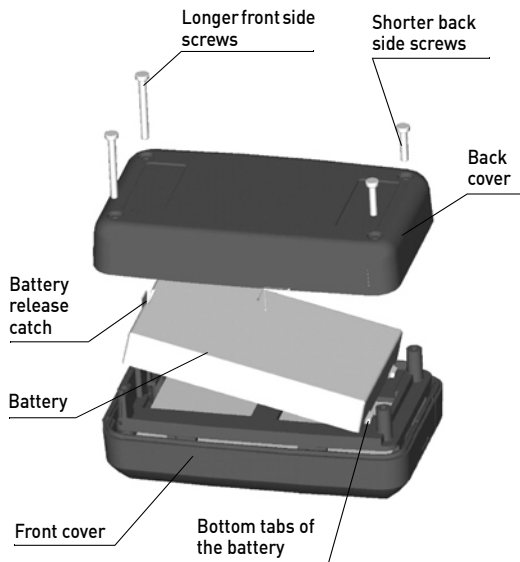
Inserting SIM-card



1. Remove the back cover and battery as described in **removing battery and back cover on page 7**.
2. Slide the SIM card holder to the right. Lift the holder into an upright position.
3. Insert SIM card into the hole. Check that the cut corner is placed at the bottom left corner.
4. Close the holder. Slide the holder back to the left until it locks.

Inserting battery and back cover

1. Place the bottom tabs of the battery into the small hollows at the bottom of the device.
2. Push the battery towards the device until it locks into place. Ensure that the battery release catch is positioned upwards.
3. Place the back cover towards the device, bottom first.
4. Press the cover to the device until it locks in place at the top.
5. Fasten the back cover with screws. Longer screws are for the front and shorter ones for the back side.



Note that battery will reach its full capacity only after two or three complete charges. For more information, see [charging the battery on page 9](#).

REMOVING BATTERY AND BACK COVER

1. Remove the screws by using the screw-driver included in Twig Locator sales package.
2. Remove the back cover by lifting it off front side first.
3. Remove the battery by pressing the battery release catch downwards and lifting the battery off.

KEYS, LEDS AND OUTER PARTS



Turning Twig Locator on and off

You can turn Twig Locator on by pressing the power on/off button. As a sign of starting-up, all three LED indicators turn on for a couple of seconds. After that the status LED continues blinking for about 20 seconds.

To turn the device off, press the power on/off button again.

Status LEDs

When Twig Locator is turned on, LED indicators express the status of the device the following way:

LED	Indicator light
Status LED	Off, when the device is in standby-mode.
GSM LED	Continuously on, when data call is on, or a SMS message is being sent or received.

LED	Indicator light
GSM LED	1 blink/sequence when having a network
GPS LED	1 blink/sequence, if the GPS has a valid position fix that is not older than 5 minutes.
GPS LED	Continuously off, if previous position is older than 5 minutes and a new position fix is not available.

You can ask the battery status by pressing the power on/off button. The status LED indicates battery level the following way:

Blinks/sequence	Battery status
1	Low (0-20%)
2	Fairly low (21-40%)
3	Fairly full (41-60%)
4	Almost full (61-80%)
Continuously on	Battery full (81-100%)

When battery is low, Locator also sends battery alarm message to your defined destination numbers. For more information, see **config 23-27: destination numbers on page 17**.

Charging the battery

1. Plug the charger cable into the bottom connector of the device (round hole on the left-hand side).
2. Plug the charger into the mains outlet.
3. Charging starts automatically. As a sign of charging, all three LED indicators are turned on for a couple of seconds. After that the GSM LED blinks in sequences, 2 blinks in a sequence at first and then 4 blinks in a sequence. When the battery is fully charged, the GSM LED stays constantly on until the charger is disconnected. If there is an interruption or failure in charging, the status LED is turned off. Unplugging and replugging the cable displays the status of charging. If the battery is full, the status LED blinks 4 times, after which it is turned off.
4. You can operate Locator during charging. However, if the battery is totally empty, it might take several minutes before the device can be used. If you turn Locator on while charging, the LEDs indicate events related to the ongoing mode, instead of showing the charging status.

TWIG LOCATOR FEATURES

Stand-by mode

When Twig Locator is turned on, it enters into stand-by mode. In the stand-by mode, the device is not activated by any process but it is ready to receive and answer location requests. Stand-by mode is deactivated when some other mode is activated.

Positioning

You can ask your Locator's position by sending it a ?LOC message. As a response, you will receive a message including information on your Locators position (coordinates), time, speed and direction. For more information, see [sending and receiving messages on page 12](#).

Tracking

Tracking mode means that Locator is activated to continuously send updated location infor-

mation. In the tracking mode, you can easily monitor movements of e.g. your car.

Tracking is activated by sending Locator a ?TRG, ?TRC or ?TRS message from a mobile phone or a back-end system supporting MPTP protocol.

If ?TRS or ?TRC is activated, tracking can be cancelled by sending a ?STO message. If ?TRG is activated, tracking is cancelled by sending a ?TRG_99_0 message.

Tracking mode can be activated simultaneously with anchor and alarm modes.

Anchor

Anchor mode can be used to anchor Twig Locator to a defined position. In anchor mode, Locator is continuously calculating its current position and comparing it with the position it had when the anchor mode was entered.

Anchor mode is switched to alarm mode, if the distance between Locator and its original position becomes more than allowed. You can

set the alarm triggering distance by defining maximum allowed movements in configuration settings. For more information, see **config 15: max. allowed movement in anchor mode on page 16**.

To enter the anchor mode, press and hold down anchor button for about 5 seconds. You can deactivate the mode by pressing the anchor button again. Anchor mode can be activated simultaneously with tracking and alarm modes.

Alarm

Alarm mode is activated, when the alarm button is pressed and held down for 3 seconds. If there is an external alarm button connected, it can also be used to activate the alarm mode. In the anchor mode, the alarm is activated automatically when Twig Locator is moved outside the defined area.

In the alarm mode, Locator is running at full power and is ready to respond to your commands. The mode is automatically deactivated

after one hour, or if another mode is activated by a command.

NMEA output

Twig Locator can send position information also as NMEA strings. NMEA, a GPS-based data transferring standard, is used to transfer data from Locator to PC.

NMEA mode can be activated while in any other mode: tracking mode, anchor mode or alarm mode. Connect Locator to PC with mini USB cable. Activate the NMEA mode by pressing and holding down the anchor and alarm buttons simultaneously for 3 seconds. When the mode is activated, the sending of NMEA data is started.

If you want to leave the NMEA mode, press and hold down the buttons again.

Messaging

SENDING AND RECEIVING MESSAGES

Position updates, tracking updates, anchor and other alarms are transmitted as SMS messages by Twig Locator. Sending tracking updates and anchor alarms, is automatical when the desired mode is on, and defined conditions are fulfilled. Messages are sent to phone numbers defined as your destination numbers. See [config 23-27: destination numbers on page 17](#) for more information.

You can send an update request to your Locator by using your phone's special applications, e.g. Twig Navigation.

When a position update request is received, Locator automatically checks if the sender's phone number can be found in White list.

If the sender's phone number is stored in White list, or if White list is empty, the phone number is consired as valid, and position update is sent as a reply. For more information about White list, see [white list on page 19](#).

VOICE CALLING

Voice calling enables you to listen to your Locator. When a call starts, Locator's microphone is activated and you can listen to what happens within microphone's reach e.g. other person's speak. Note that there is no speaker in Locator, so transmitting voices to Locator is not possible.

A voice call can be initiated by Locator or a partner. If the call is initiated by Locator, the available phone numbers are defined in voice call numbers. See [config 28-32: voice call numbers on page 19](#) for more information.

If the call is coming from a partner, and automatic answer is set off, the call is automatically rejected. If the automatic answer is set on, the phone number is automatically compared to the phone numbers stored in White list. If the number is stored in the list, or if White list is empty, the call is accepted. For more information about defining automatic answer and White list, see [config 9: voice call auto answer on page 18](#) and [white list on page 19](#).

CONFIGURATING LOCATOR

Installing software and drivers

There is an installation CD-ROM included in your Twig Locator sales package. To configure Twig Locator with your PC, you need to install application software and USB-drivers from the CD-ROM into your PC.

Connecting to computer

Once the software and drivers are installed, you can establish a connection between Locator and your computer.

Note that Locator **must be turned off** when connecting to computer except when the NMEA mode is activated.

Connect Locator to your computer with Mini USB cable. Then double-click Locator .exe-file on your computer to open the configuration software.

Once the software is open, choose the right COM-port from the **COM** drag-down menu and press **Connect**. The connection between Locator and PC is established.

Configuration settings

Connect Locator to your computer as described in **connecting to computer on page 13**. You can edit and define several settings, including security settings and available connections, to be used with your Locator.

DEVICE INFORMATION

The **Info** box displays details on your Locator , including the IMEI (International Mobile Equipment Identity) code as well as software version and GSM module numbers.

SECURITY SETTINGS

Locator's SIM card can be protected by defining PIN and security code numbers. You can also define an ID for your device.

CONFIGURATING LOCATOR

Fields for
configuration
settings

Read set-
tings from
Locator

Configure
Locator

Read settings
from PC

Save settings
to PC

Update software

The screenshot shows the 'l2update' application window. It features a list of 16 configuration fields on the left, each with a corresponding input box on the right. Below these fields are sections for 'EE' (EEPROM) and 'Firmware' updates, each with a file name input field and several action buttons. On the right side of the window, there are buttons for opening configuration and white list files, an 'INFO' section displaying device information, a 'COM' section for connecting to the locator, and buttons for selecting files to configure or update.

Field Number	Field Name
1:	PIN code
2:	ID
3:	Security code
4:	
5:	
6:	SMSC number
7:	
8:	Terminate voice call
9:	Voice call auto answer (YES/NO)
10:	Auto leaving from alarm mode
11:	Max GPS search time
12:	GPS update in Basic mode
13:	GPS update in Tracking mode
14:	GPS update in Anchor mode
15:	Max allowed movement in Anchor mode
16:	Battery alarm level

EE
EE file name:
Buttons: Program EE, Read EE, File Read EE, File Write EE, Select EE

Firmware
FW file name:
Buttons: Program FW, Select FW

INFO
MC55 FW: No Data
MC55 IMEI: No Data
L II FW: No Data

COM
Buttons: Connect,

Buttons on the right:
Config 1-16
Config 17-32
White L 1-16
White L 17-32

Open configura-
tion fields 1-16

Open configura-
tion fields 17-32

Open White list
fields 1-16

Open White list
fields 17-32

Device informa-
tion

Connect Locator
with PC

Choose COM-
port

Select file to
configure

Select software
file

Config 1: PIN Code

PIN code (4 digits) is used to unlock your SIM card, unless you are using a SIM card in which the PIN code is disabled.

Default value for PIN code is **9999**. Replace the value with your own PIN code, or leave the field blank if the PIN code has been disabled.

If the PIN code is defined incorrectly, you won't be able to turn on your Locator. After three failed attempts, the SIM card will be blocked.

If your SIM card gets blocked, you need a PUK code (8 digits) to open it. Remove the SIM card for Locator and install it into a phone compatible with your SIM card. When trying to open the phone, it will prompt you for the PUK code. After entering the PUK code, key in a new PIN code. You can then install the SIM card back to Locator.

If you fail to key in the correct PUK code 10 times in a row, your SIM card will be permanently blocked. If this happens, contact your network operator to get a new SIM card.

Config 2: ID

You can define an identification code for your Locator. This code may contain both numbers and letters, and it is case sensitive. Default value for the ID code is: **Locator_2**.

Config 3: Security code

Security code is used when configuring Locator and activating its different features. The security code consists of 4 digits. Default security code is **0000**.

ALARM SETTINGS

Config 10: Auto leaving from alarm mode

Auto leaving from alarm mode defines time after which Locator automatically leaves the alarm mode. Valid values for this field are between **00.30.00** (hh.mm.ss) and **23.59.59** (hh.mm.ss). Default value is **01.00.00** (one hour).

Config 15: Max. allowed movement in anchor mode

You can define a maximum distance that Locator is allowed to move from the original position in the anchor mode. Once the limit is exceeded, a movement alarm is triggered. Allowed distance can be set to: **0035... 9999** (meters). Default value is **0250** (meters).

Config 16: Battery alarm level

Locator can alert you when its battery level is declined under certain level. You can define the alarm level at **20**, **40**, or **60** percentage of full battery charge. Default value for the alarm is **20** percent. Note that value **00** means that the alarm is deactivated.

GPS SETTINGS

You can define settings for GPS positioning in different modes, as well as set time limit for refreshing GPS position.

Config 11: Max GPS search time

You can define for how long GPS is trying to get a refreshed position after receiving a position request. If the refreshed position is not acquired within that time, Locator sends position update using the previously stored position. Valid values for GPS search time are between: **00.00.00... 00.10.59** (hh.mm.ss). Default value is **00.01.00** (one minute).

Config 12: GPS update in basic mode

You can define how frequently GPS is updating position in the basic mode. Time interval can be set to: **00.00.10... 00.59.59** (hh.mm.ss). Default value is **00.05.00** (five minutes).

Config 13: GPS update in tracking mode

You can define time interval for GPS position updates in the tracking mode. Valid values are between: **00.00.10... 00.59.59** (hh.mm.ss). Default value is **00.10.00** (ten minutes).

Config 14: GPS update in anchor mode

You can define time interval for GPS position updates in the anchor mode between: **00.00.10... 00.59.59** (hh.mm.ss). Default value is **00.01.00** (one minute).

MESSAGING SETTINGS

You can define the SMS center number that is used in SMS messaging, as well as destination numbers to define where alarms and position updates are sent by Locator. You can also define, whether or not you wish to enable !IND messages.

Config 6: SMSC number

The SMS center number is normally stored in you SIM card from where Locator reads it automatically.

If there is no SMS center number available in the SIM card, the number stored in SMSC number field is used instead. If both an SMS center number in the SIM card and a stored number in SMSC number field are available, the number in the SIM card is used.

If you wish to define a number in the SMSC number field, write the digits together without blanks and special characters. If you wish to use international phone numbers, write sign + and the country code in front of the number. Or use national phone numbers without + and the country code.

Config 23-27: Destination numbers

You can define five destination numbers in the fields **23: Alarm number 1.. 27: Alarm number 5**. Alarm messages, including battery alarm messages, are sent to these numbers.

Write the phone numbers using international code.

VOICE CALL SETTINGS

Voice calls can be initiated by Locator under specific circumstances. You can define allowed phone numbers for outgoing voice calls, as well as settings for terminating and auto-answering voice calls.

Config 8: Terminate voice call

Terminate voice call defines time limit for voice calls. When the limit is reached, the voice call will be automatically closed. Available values for the time limit are: **00.01.00...00.59.00** (hh.mm.ss). Default value is **00.10.00** (ten minutes).

Config 9: Voice call auto answer

You can define whether or not you wish Locator to answer automatically to incoming voice calls. Default value for this field is **NO**. If you wish to set the automatic answer on, type **YES**.

Answering voice calls depends on both the automatic answer and White list settings:

- Automatic answer is off, there are no numbers stored in White list: Incoming call is rejected and a location message (!LOC) is sent to the caller.
- Automatic answer is off, there are numbers stored in White list: If the caller's phone number can be found in White list,

the call is answered. Otherwise the call is rejected and a location message (!LOC) is sent to the caller.

- Automatic answer is on, there are no numbers stored in White list: All incoming calls will be answered.
- Automatic answer is on, there are some numbers stored in White list: If the caller's number can be found in White list, the call is answered. Otherwise the call is rejected without sending a location message.

For more information about White list numbers, see **white list on page 19**.

Config 17: !IND messages (YES/NO)

You can define whether !IND messages can be sent or not. A !IND message is sent when anchor alarm is activated by pressing the anchor button.

The default value for !IND messages is **NO**. If you wish to enable sending !IND messages, change the setting into **YES**.

Config 18: Mic Bbcgain

You can define microphone volume level compared to the default volume level of Locator's GSM module. The field value can be set to **0-7**, in which each number represents an increase of 6 decibels compared to the original GSM module settings. There is no default value for this field. If the field is empty, original GSM module volume level is used.

Config 28-32: Voice call numbers

Available phone numbers for outgoing voice calls can be defined in configuration fields 28-32. Write the phone number digits together without blanks and special characters. If you want to use international phone numbers, write the plus sign (+) and a country code in front of the number. Or use national phone numbers without the plus (+) and the country code.

When a call is initiated, Locator starts calling to the first defined phone number (Field 28). If the call can be established to this number, there will be no attempts to another numbers.

If the call cannot be established to the first number, the second number is called instead. The cycle will go on until three attempts to all defined numbers.

Note that outgoing voice calls can be initiated only if there is at least one voice call number defined.

WHITE LIST

In the White list, you can restrict phone numbers from which voice calls and commands can be received by your Locator.

White L1-32: White list numbers

You can define up to 32 White list numbers which can be any valid phone numbers. When there is at least one stored phone number, the White list is activated. This means that incoming voice calls and commands are accepted only, if they are received from the White list numbers. The authorization is done by comparing the last 7 digits of the sender's phone number to the corresponding digits of all your stored White list numbers.

Write the phone number digits together without blanks and special characters. If you want to use international phone numbers, write the plus sign (+) in and a country code in front of the number. Or use national phone numbers without the plus sign (+) and the country code.

Note that if there are no White list numbers defined, incoming voice calls and commands may be accepted from any sending device. For more information on accepting incoming voice calls, see [config 9: voice call auto answer on page 18](#).

Opening and saving settings

Before opening and saving configuration settings, make sure that the connection between Twig Locator and the PC is established in a way described in [connecting to computer on page 13](#).

To open existing configuration settings for editing and saving, press the **Select EE** button to search for your Twig Locator configuration

file. Then press **Read EE** to open the settings which are currently saved in Locator. If you wish to open the settings file stored on your computer, press **File Read EE**. You can now edit the settings as you wish.

You can configure your Locator according to your defined settings by pressing the **Program EE** button. A progress bar displays the status of the configuration update. If you want to save the configuration settings to your PC, press **File Write EE**.

Updating software

Updating software is done in the **Firmware** field. Press **Select FW** to browse for the software update file. Update your existing Twig Locator software by pressing **Program FW**. A progress bar displays the status of the updating process.

ACCESSORIES AND BATTERIES

Following accessories are available for this product:

Accessory	Type	Order code
Mains charger EU	CMA-80-230	Y03005
Mains charger UK	CMA-80-230	Y03006
Plug-in charger	CCS-80-12	Y03010
Standard battery	BBL-80N	Y03000
Mini USB Cable		YC3003

Note: use only accessories and batteries approved for this device by the device manufacturer. The use of incompatible accessories and batteries may cause undesired operation and void the manufacturer's warranty for the product.

Check the compatibility of new power supply units and other accessories at the dealer or manufacturer.